

FIG.1

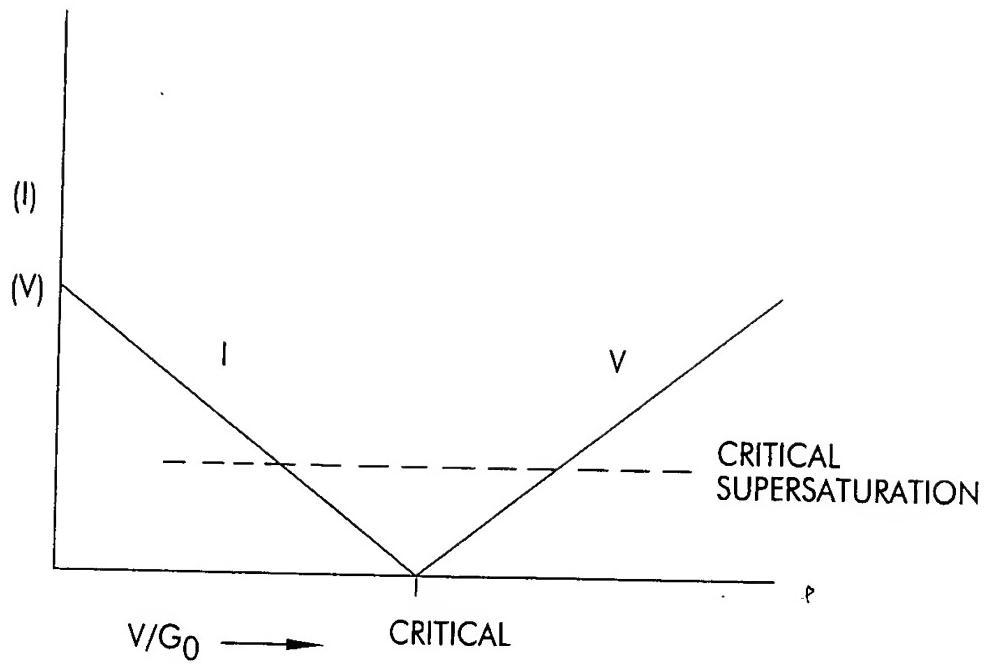


FIG.2

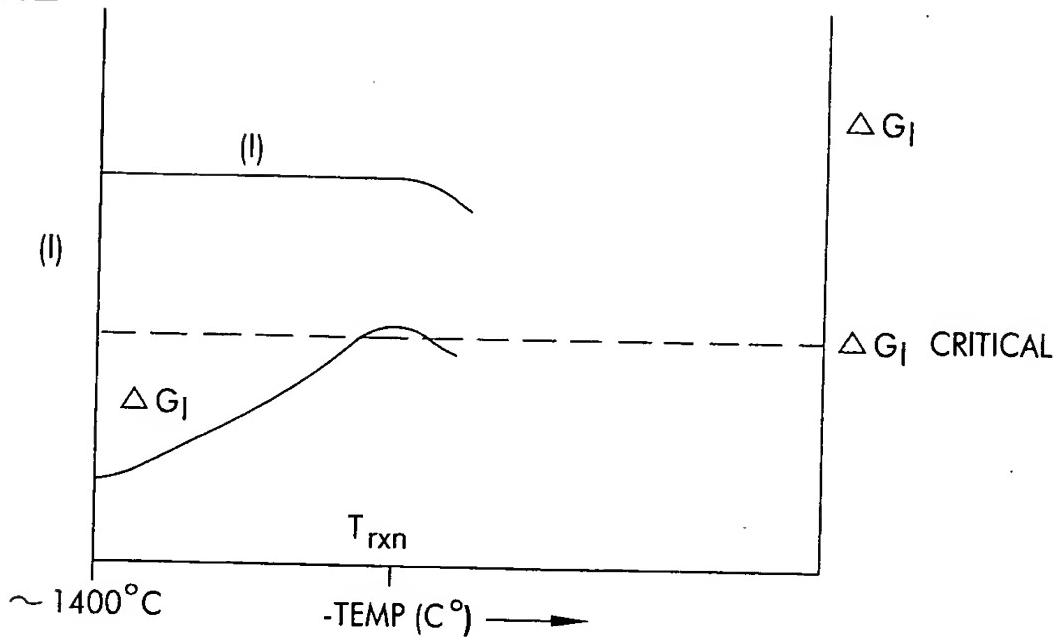


FIG.3

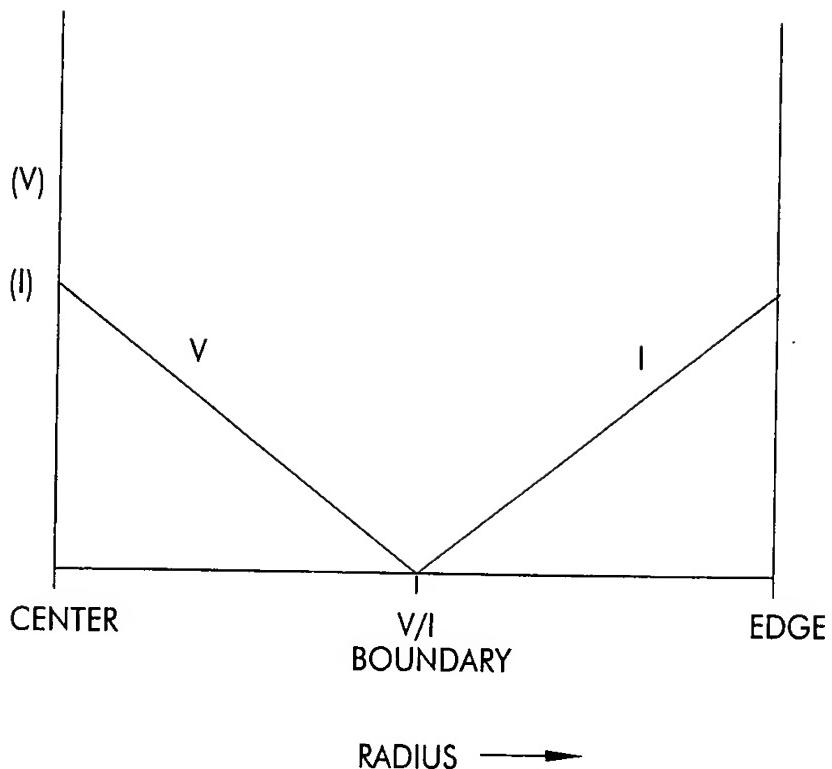


FIG.4

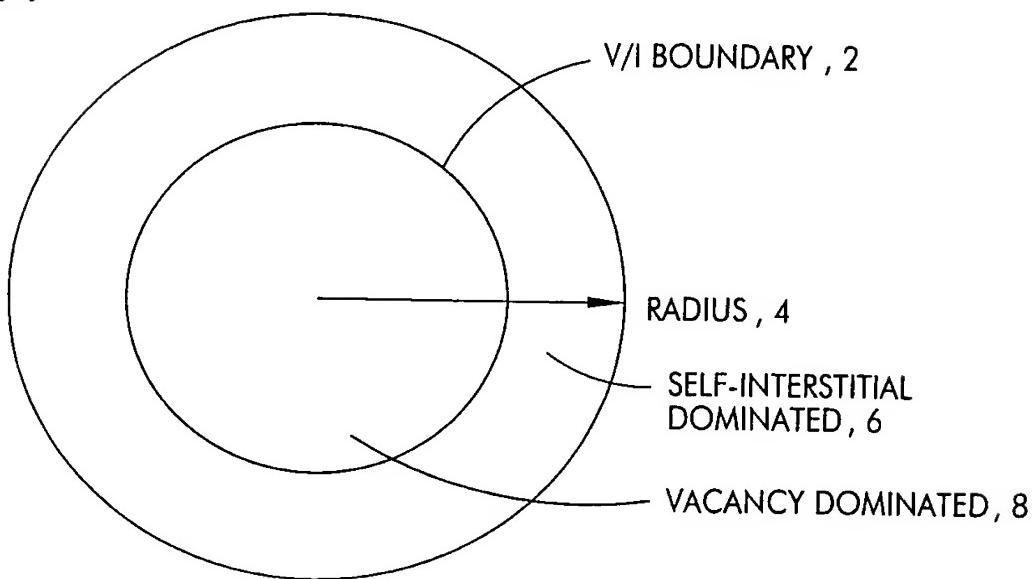
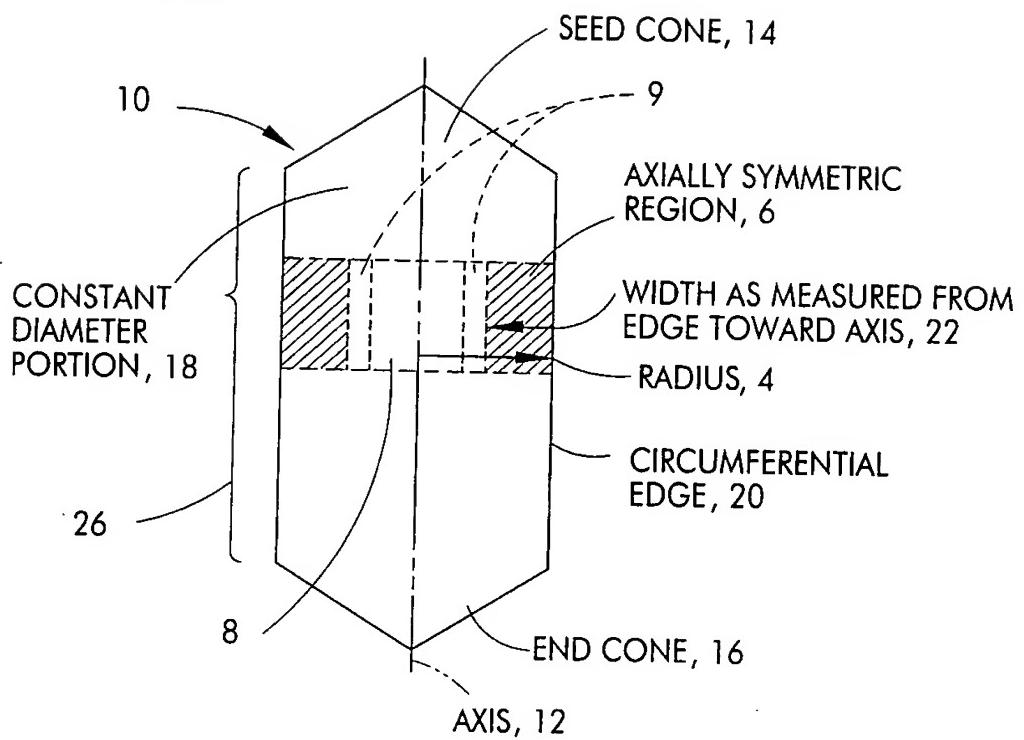


FIG.5



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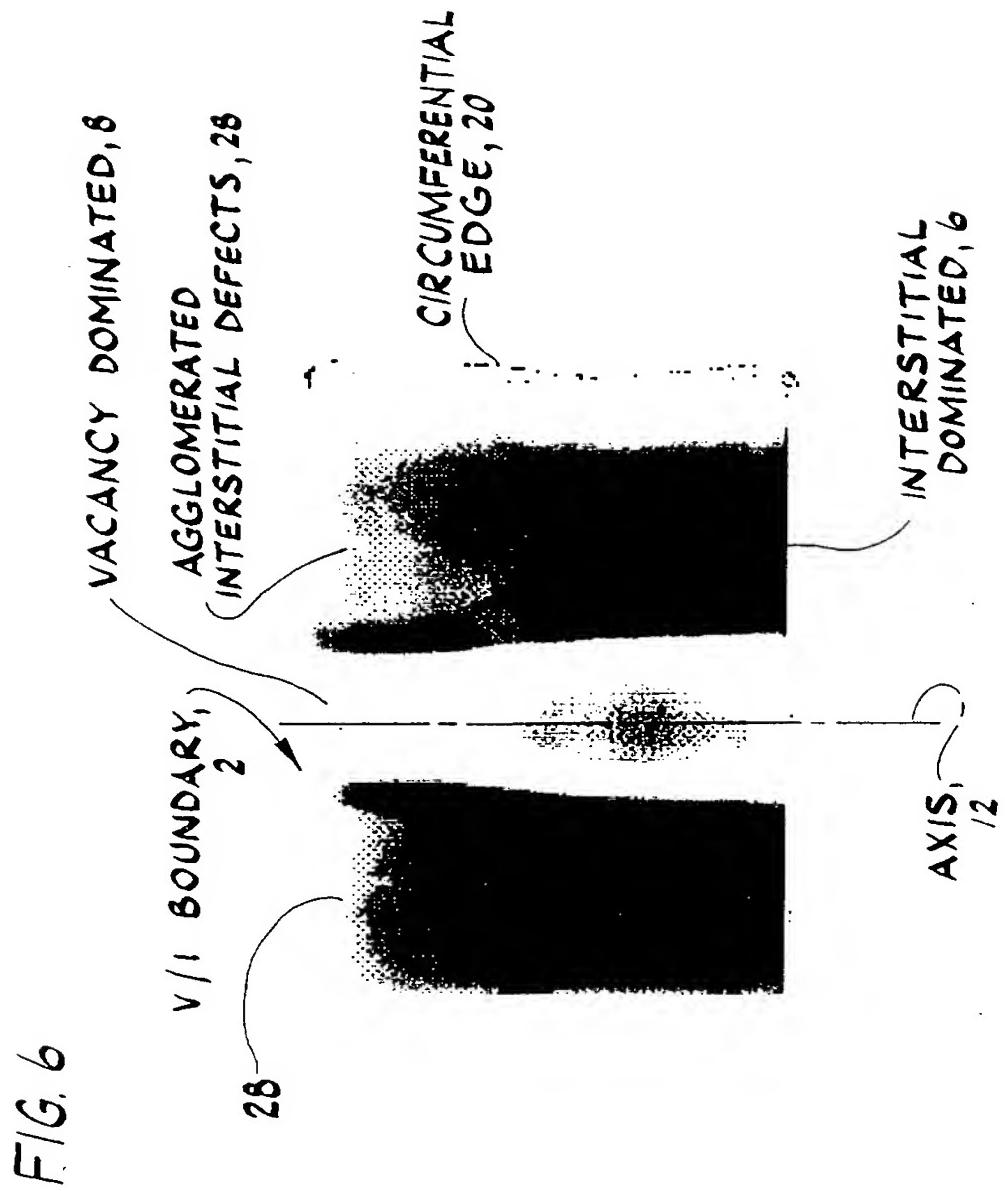
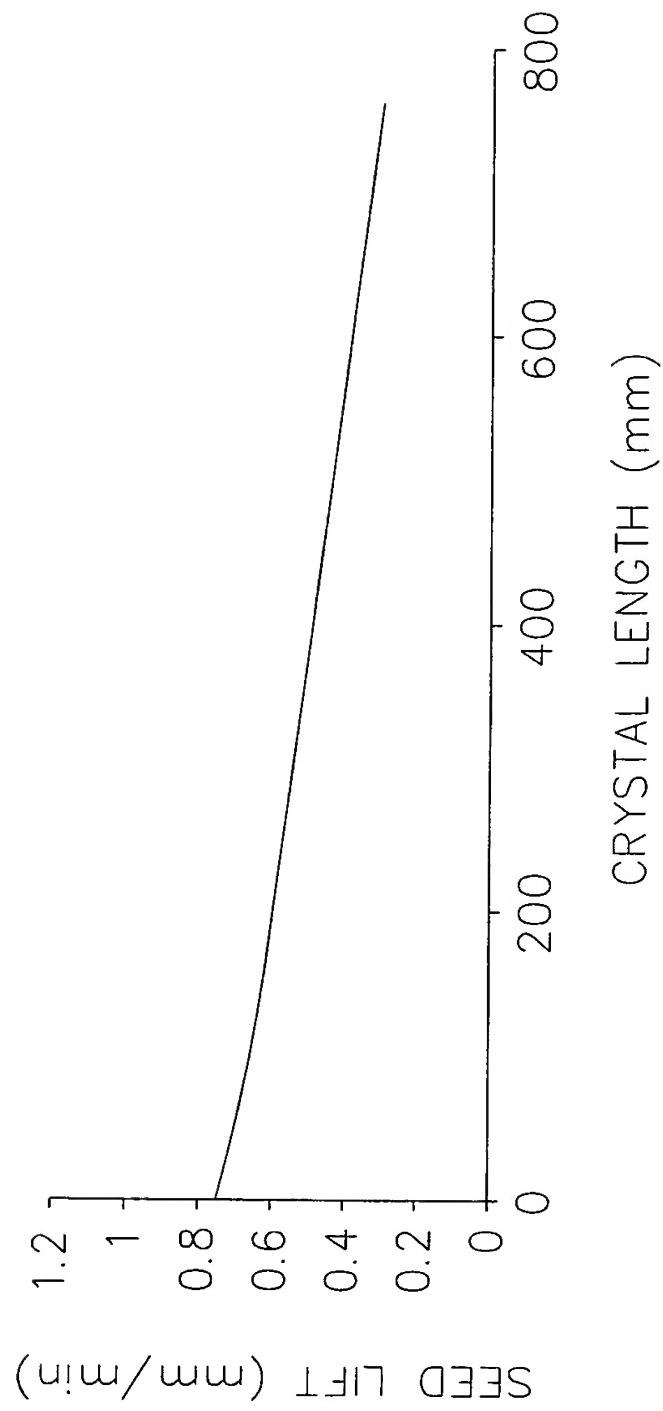
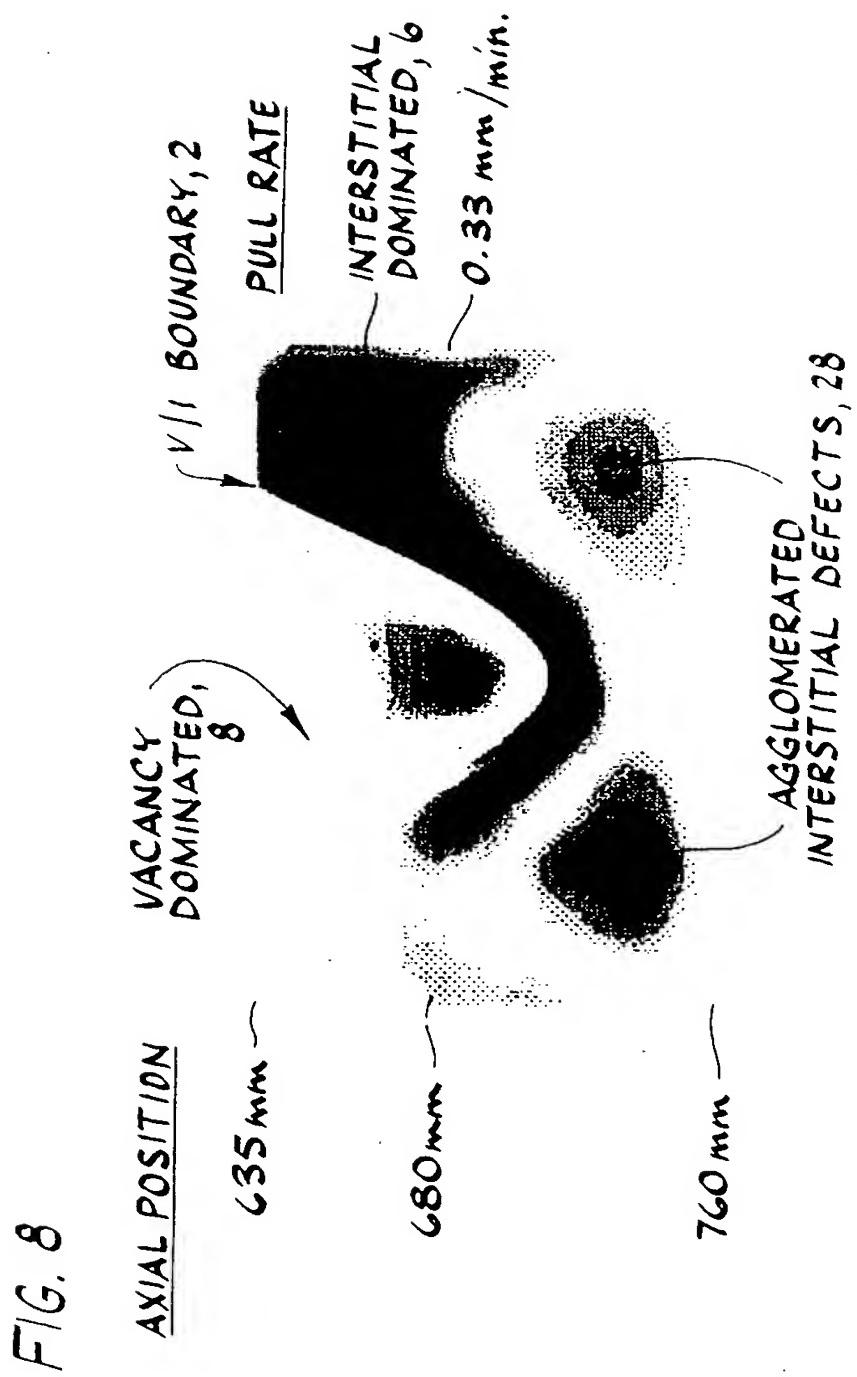


FIG. 7

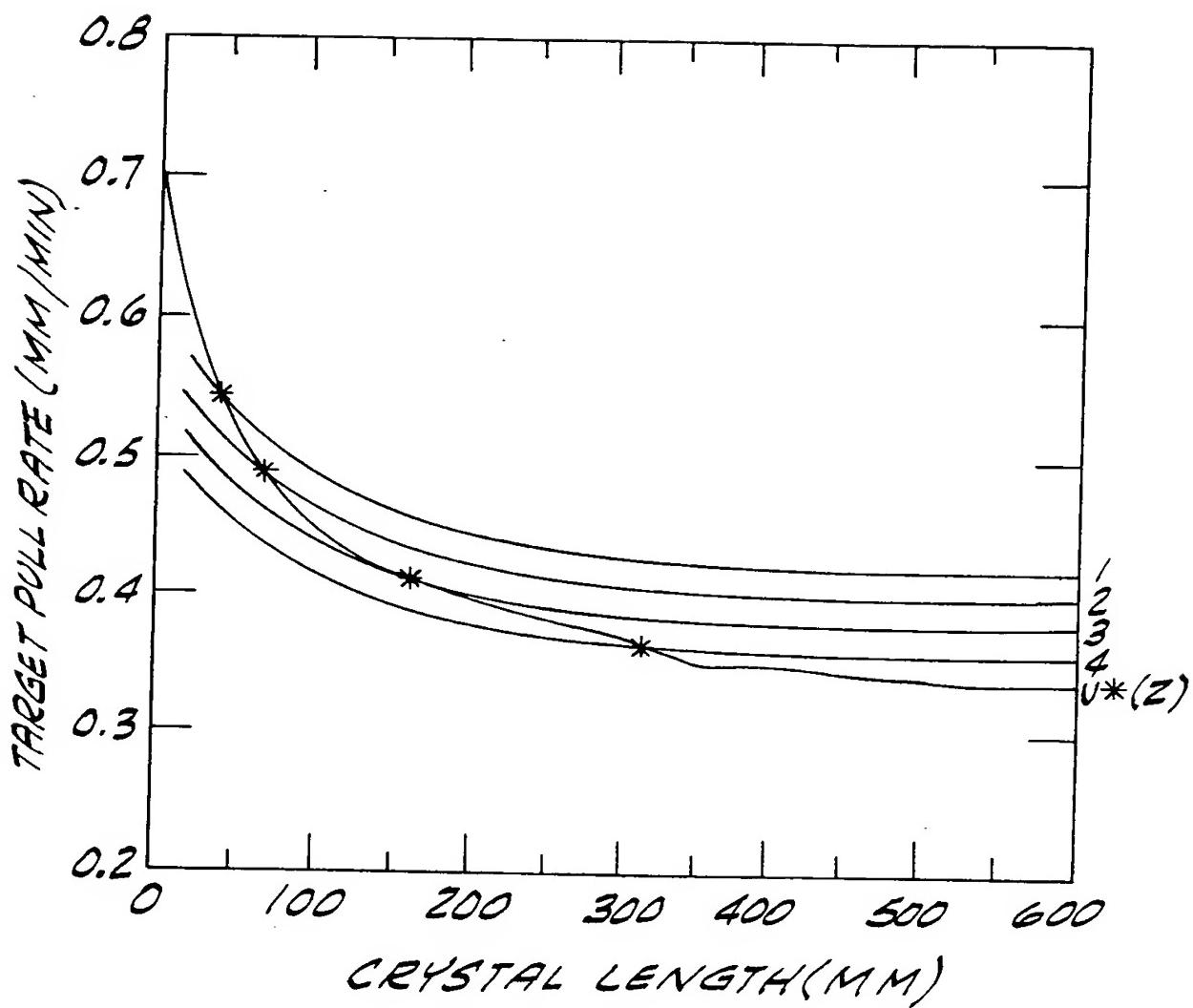


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FIG. 9



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FIG. 10

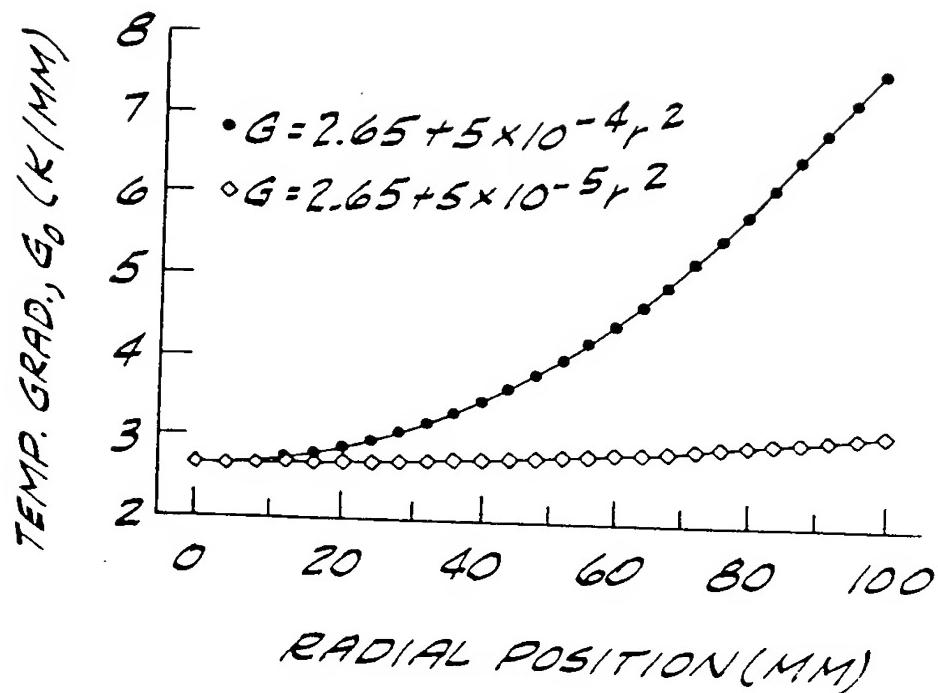
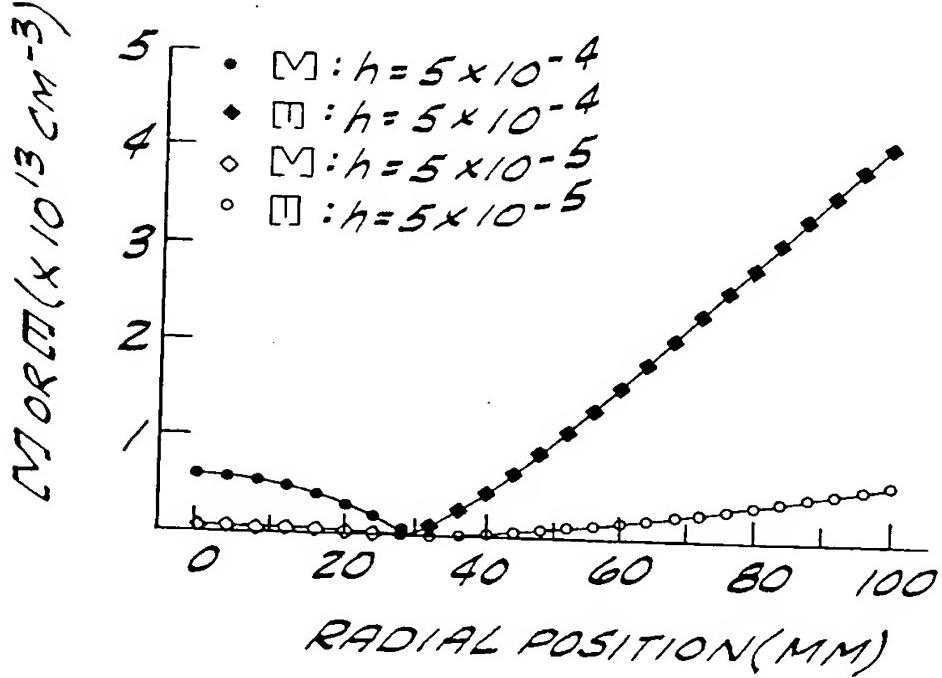
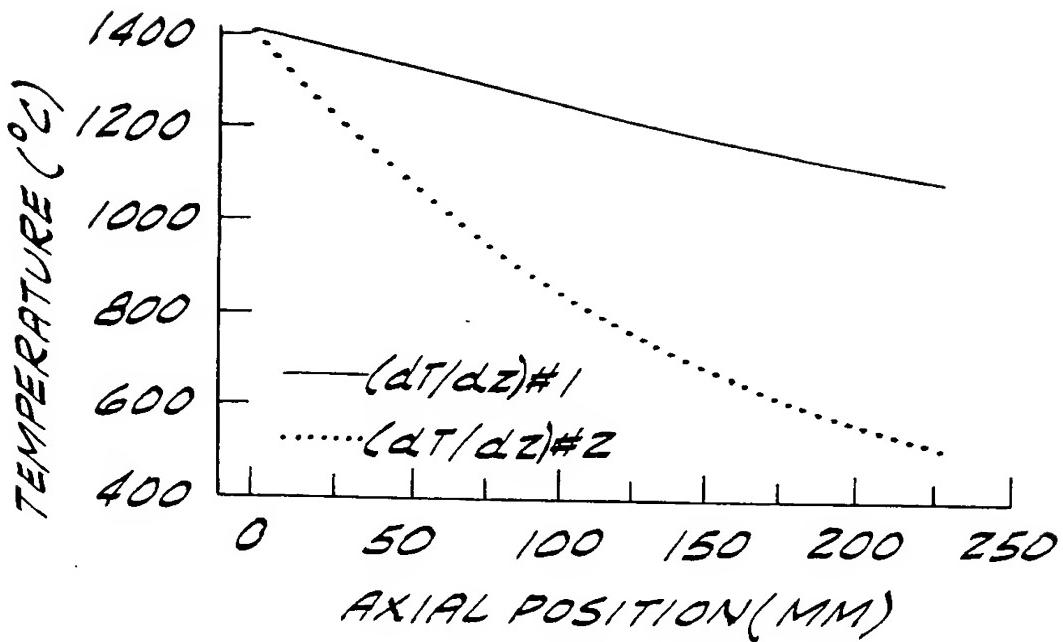


FIG. 11



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FIG. 12



2011 PTE 20 = SOURCE DOCUMENT

FIG. 13

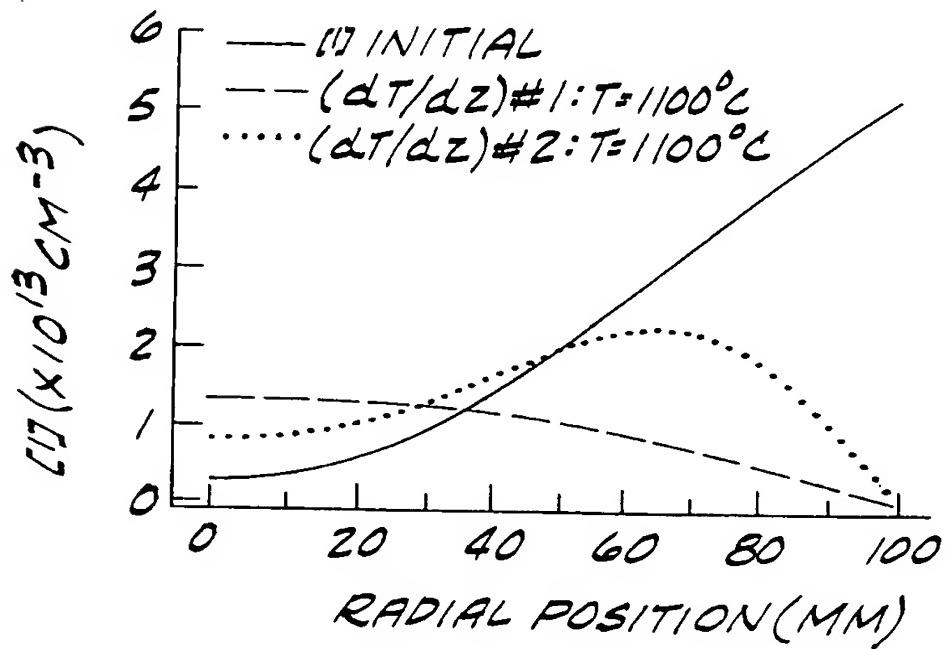
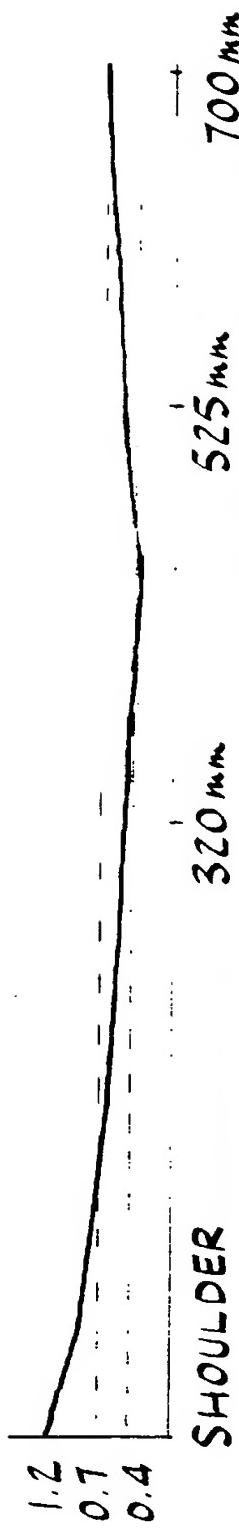


FIG. 14

SEED LIFT (mm/min.)



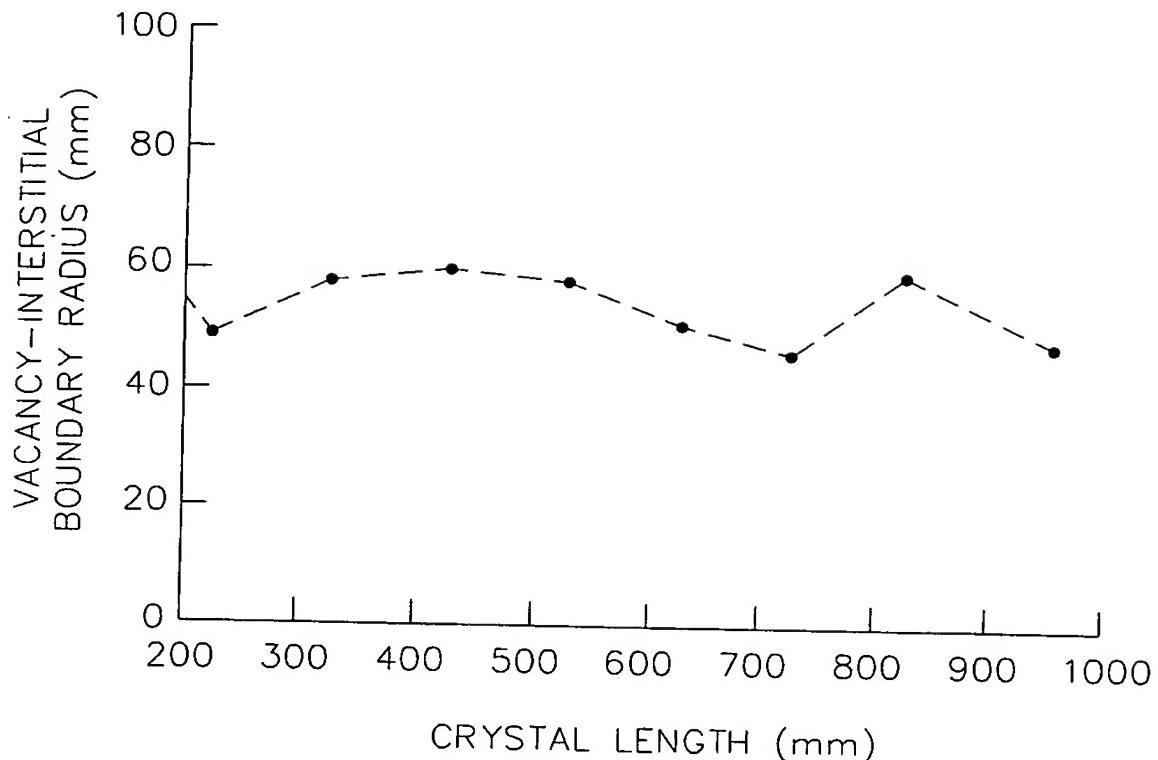
SHOULDER



320 mm      525 mm      700 mm

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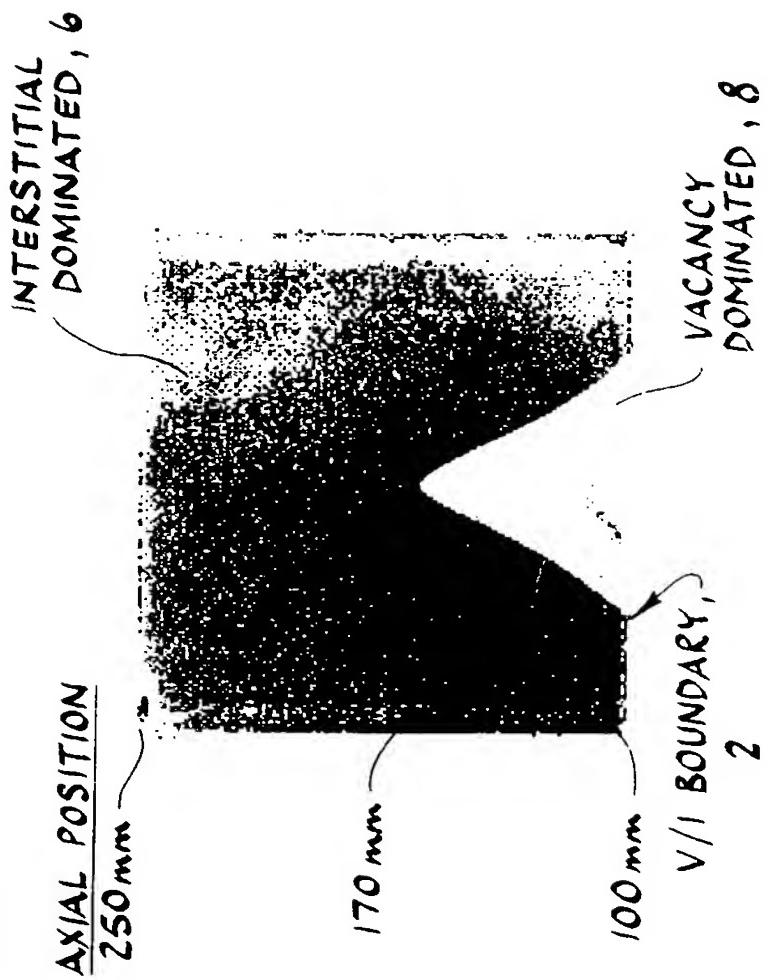
FIG. 15



2011 RELEASE UNDER E.O. 14176

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FIG. 16a



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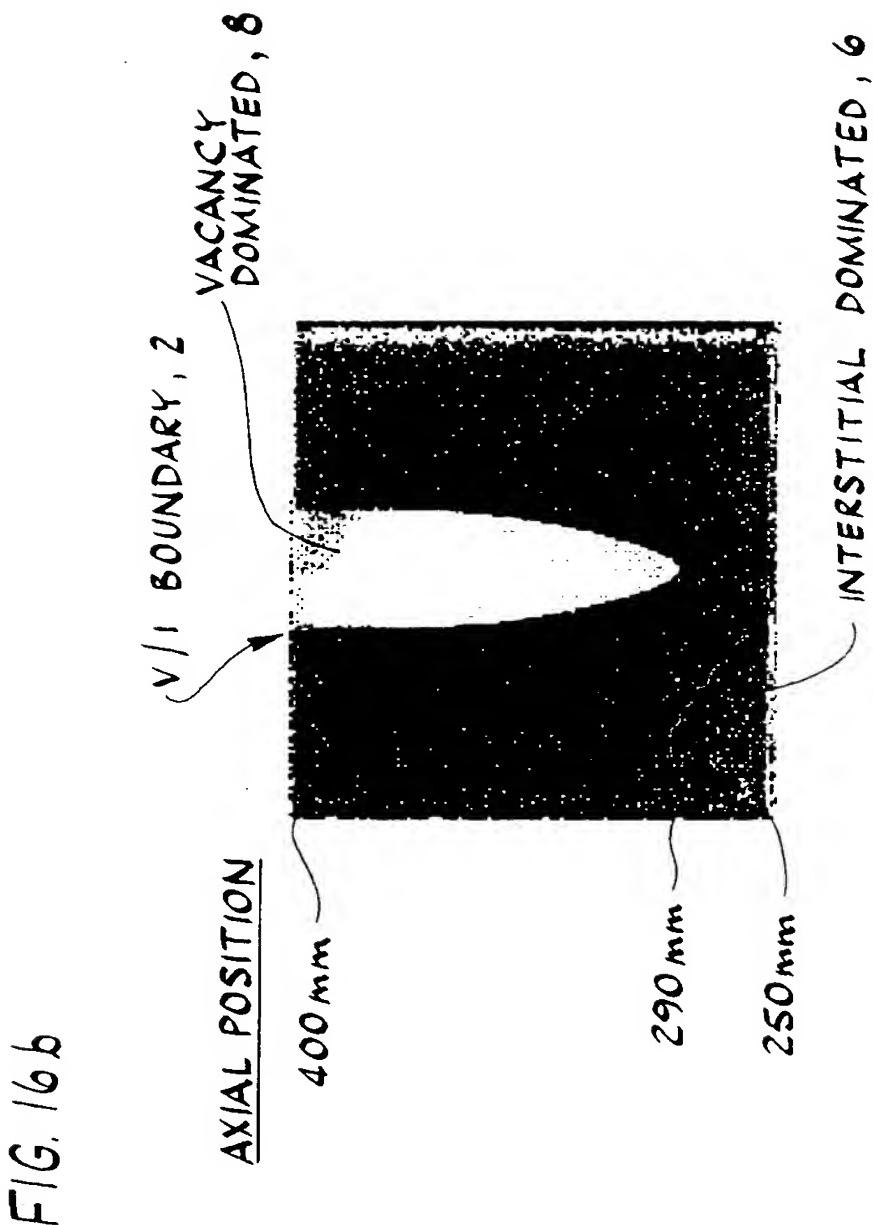


FIG. 17

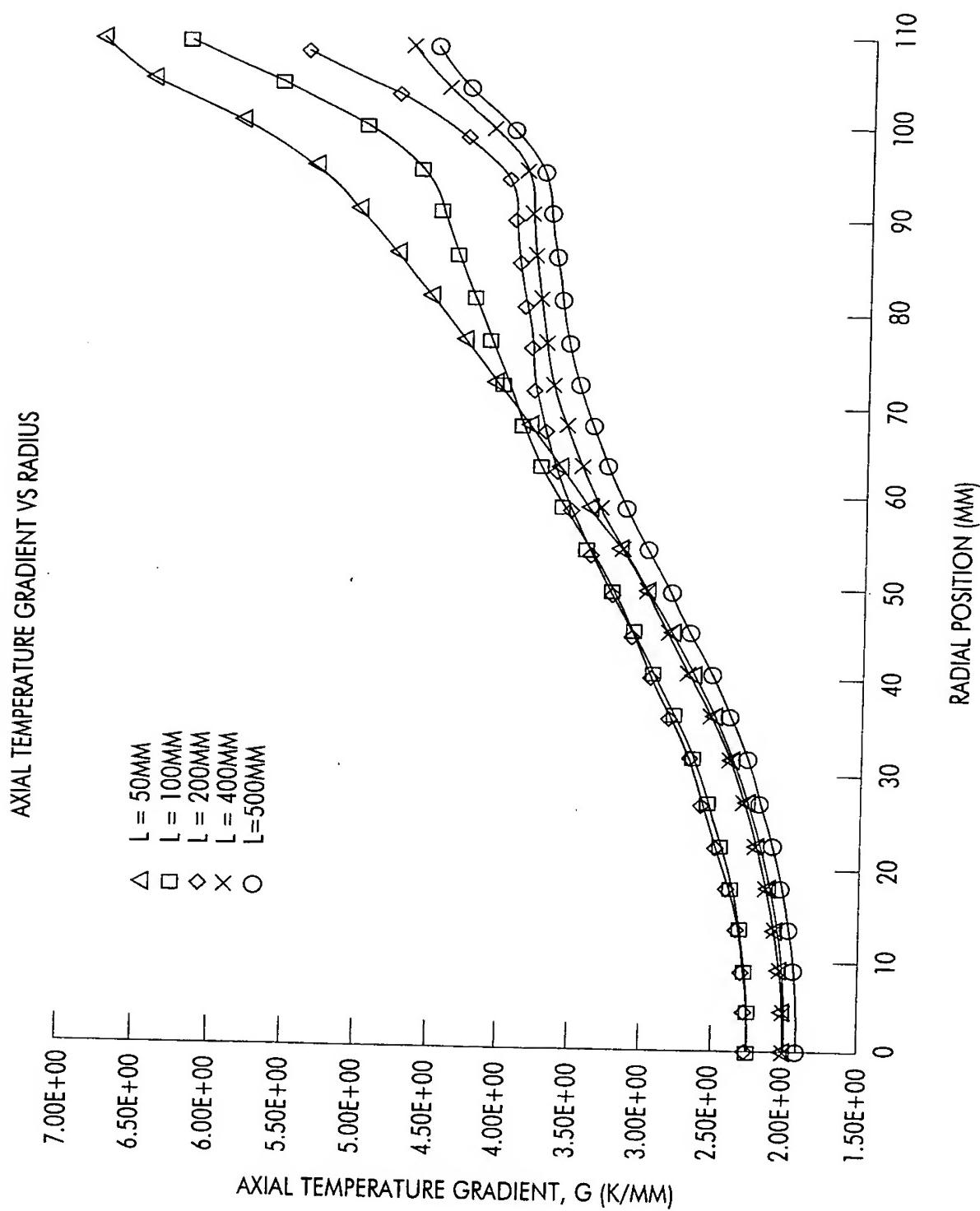


FIG. 18

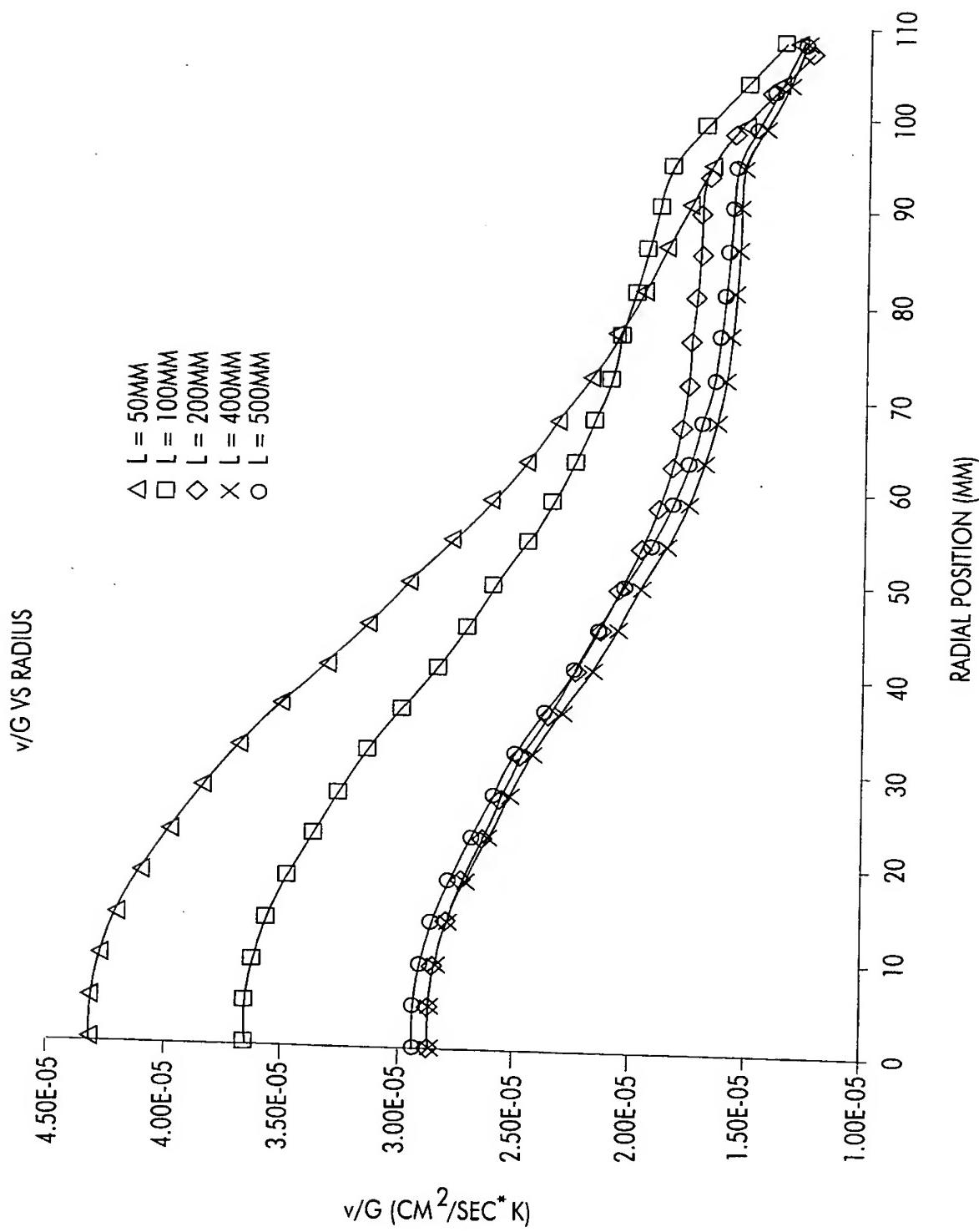
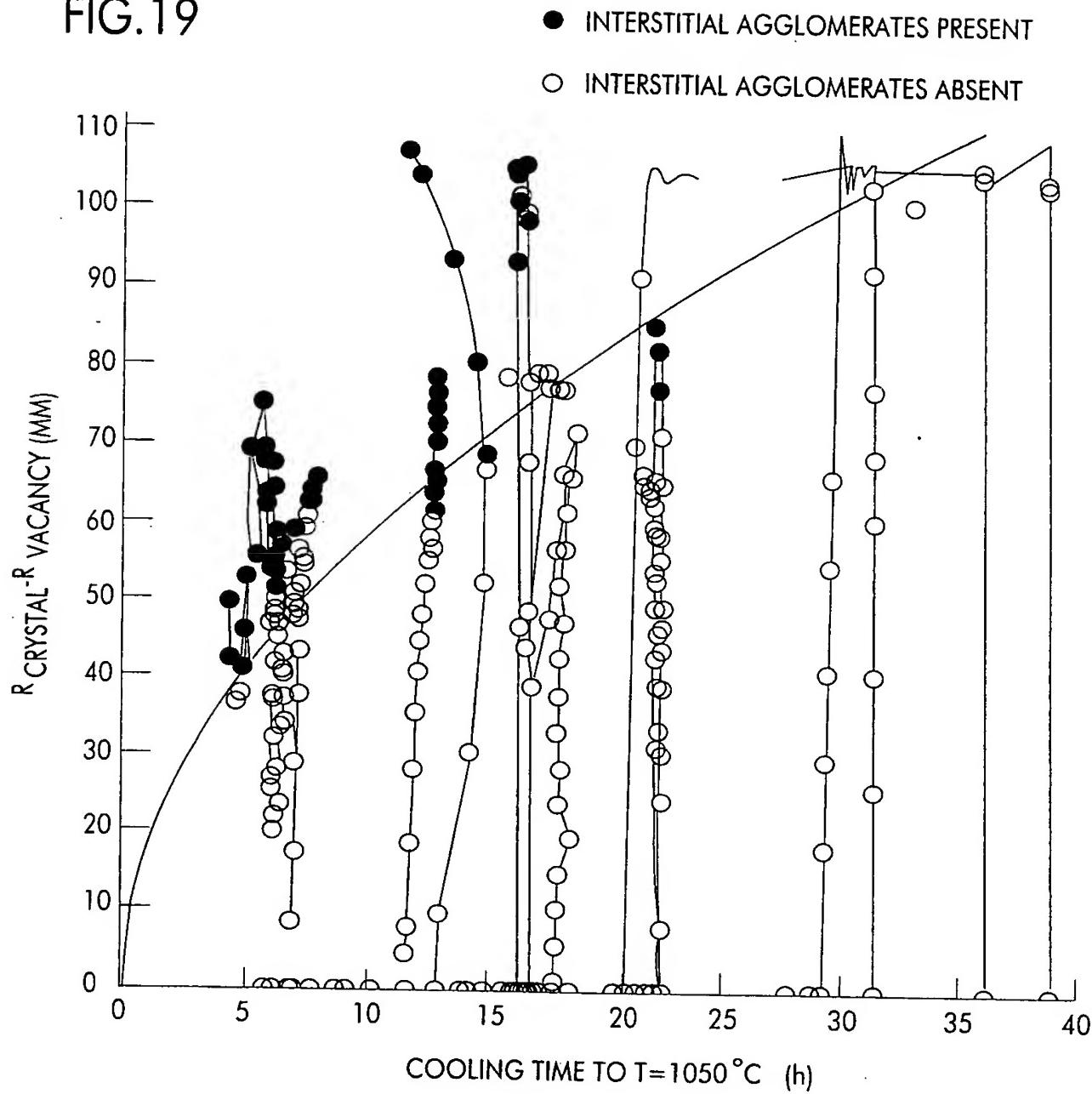
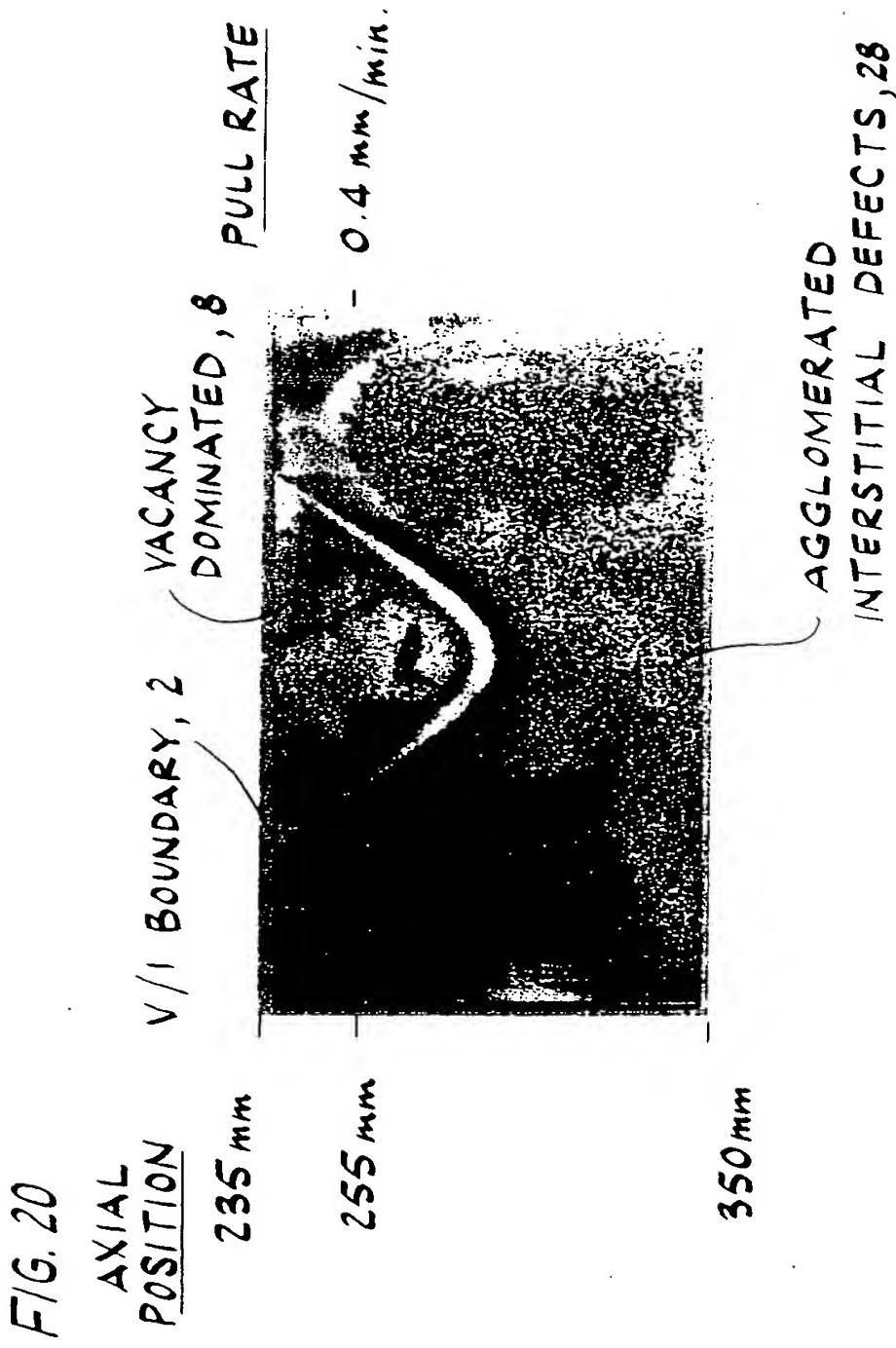


FIG. 19



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8

20 T.F. 20° 50% SiO<sub>2</sub> 200°C

FIG. 21

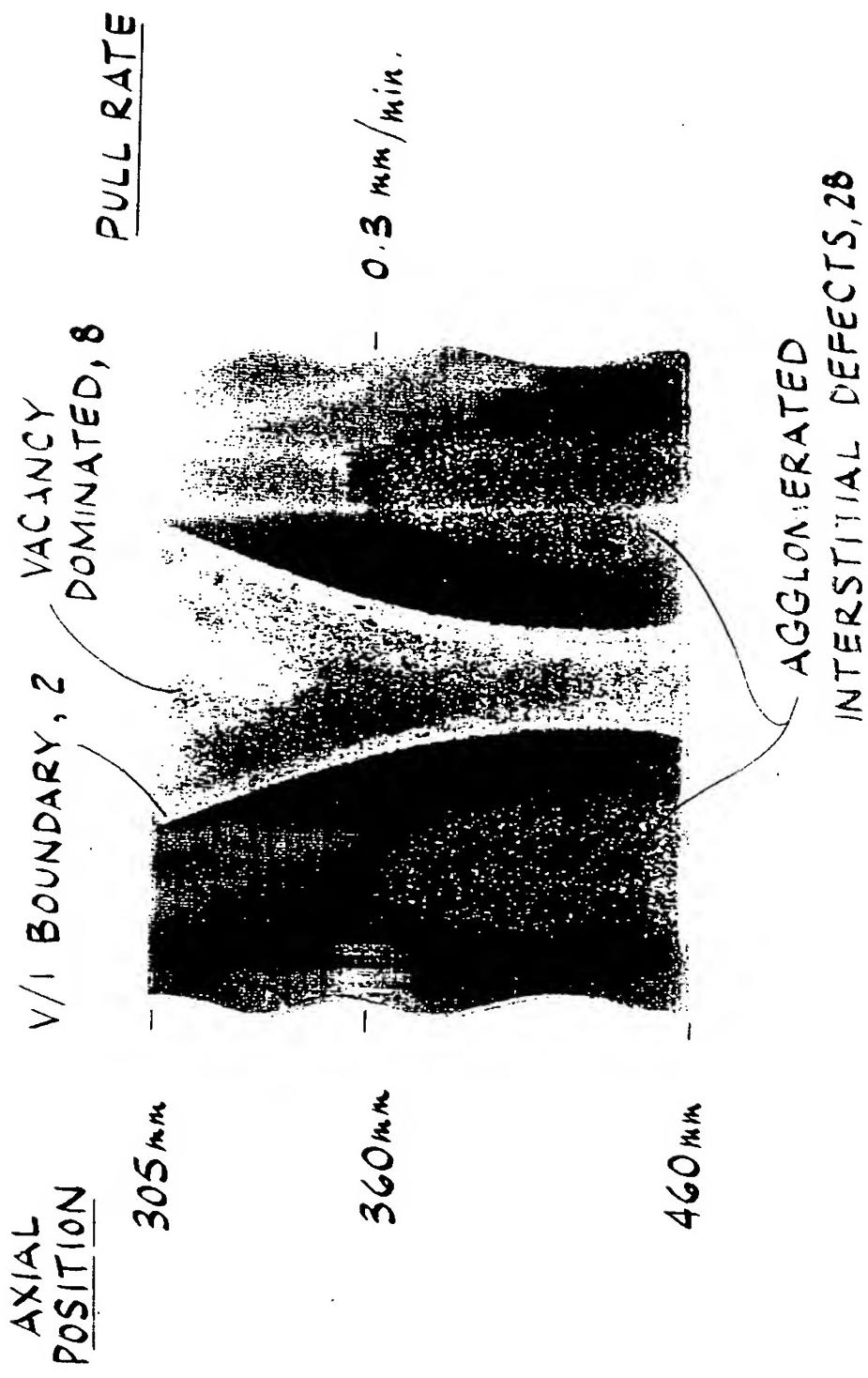
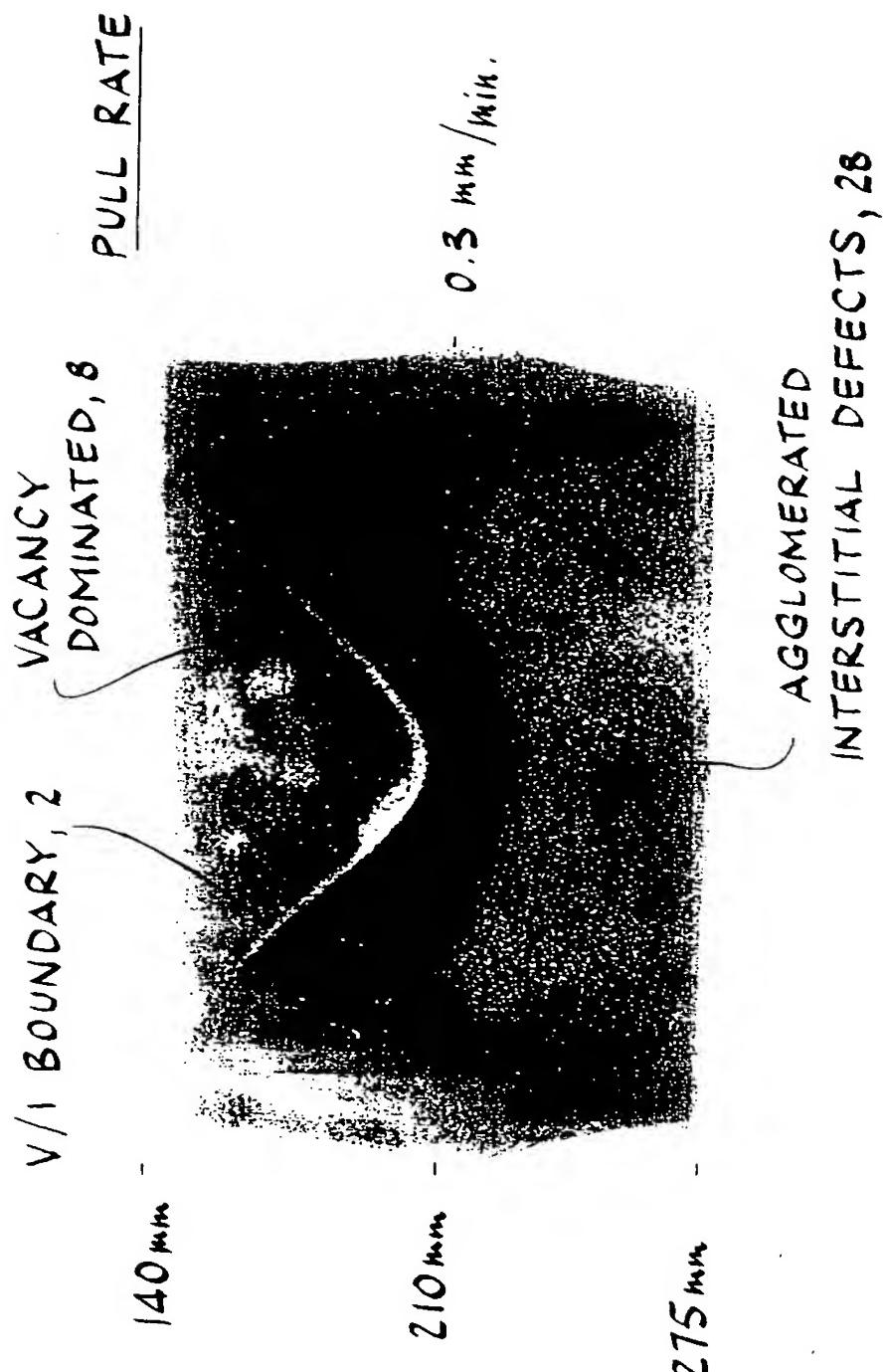


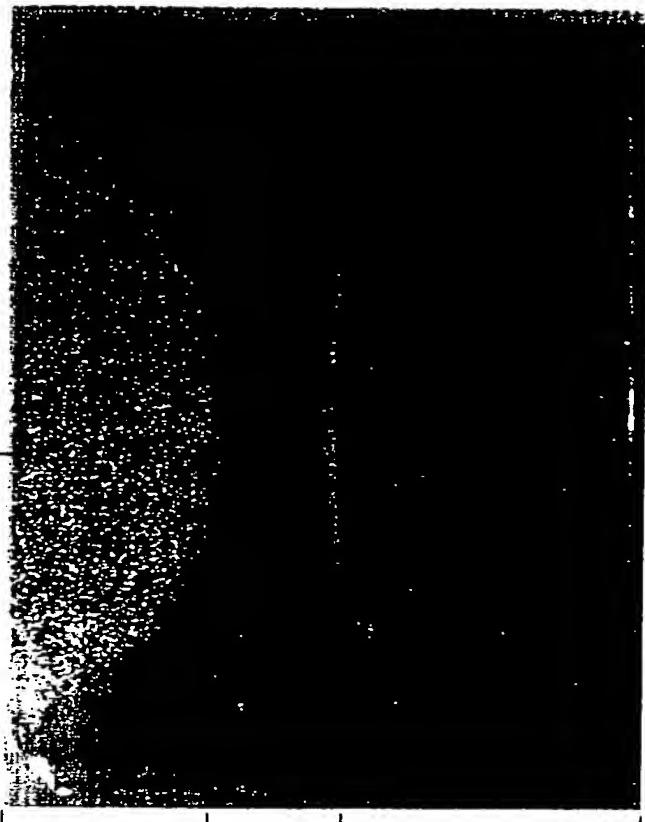
FIG. 22



20/30 = 20% SOLUTE CONC

FIG. 23

AXIAL POSITION  
600 μm  
AGGLOMERATED  
(INTERSTITIAL DEFECTS, 28  
PULL RATE



VACANCY  
DOMINATED, 8

20/30

8

FIG.24

## G VARIATION VS Z FOR VARIOUS HOT ZONES

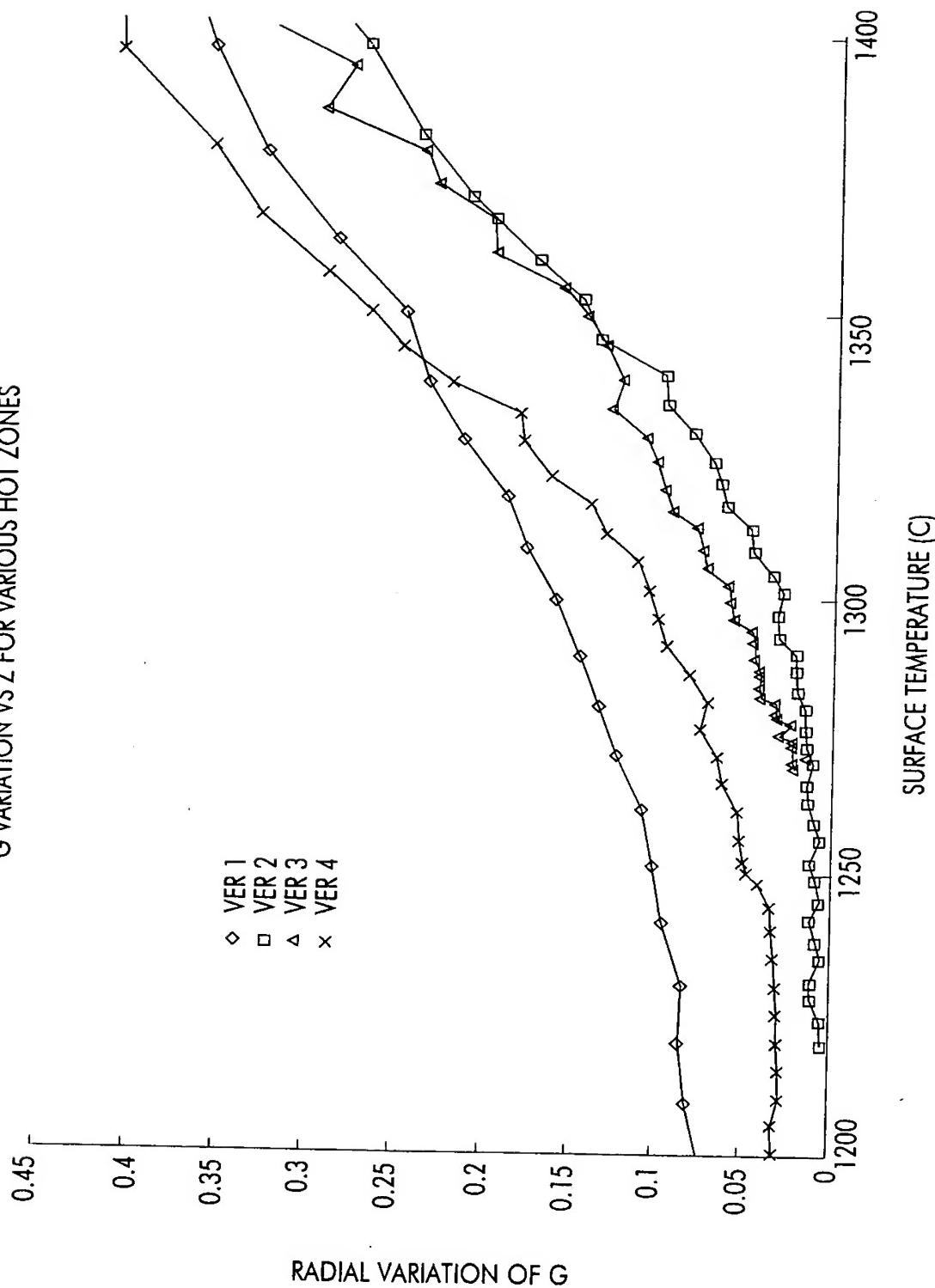


FIG.25

## TEMPERATURE PROFILES FOR VARIOUS HOT ZONES

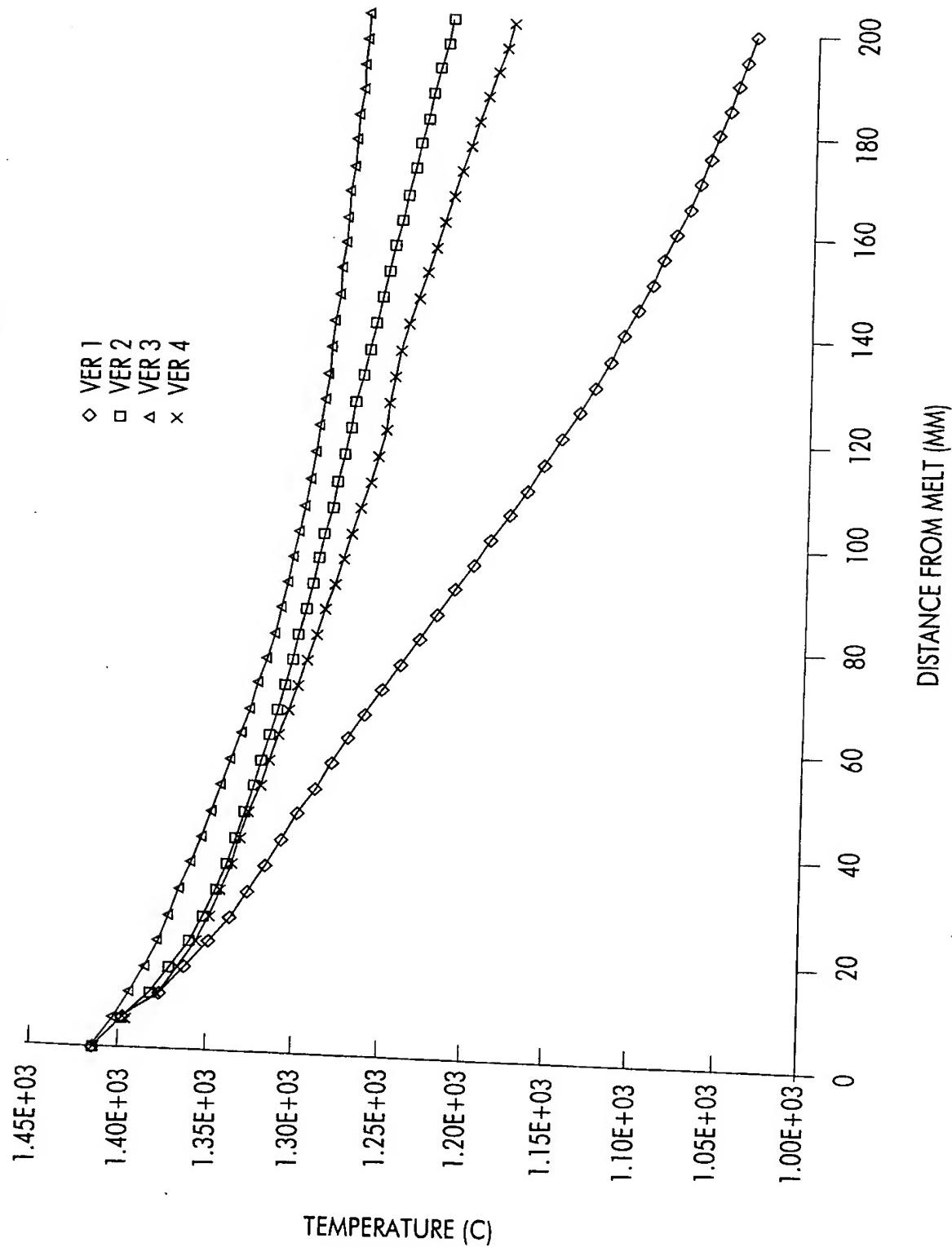




FIG. 26

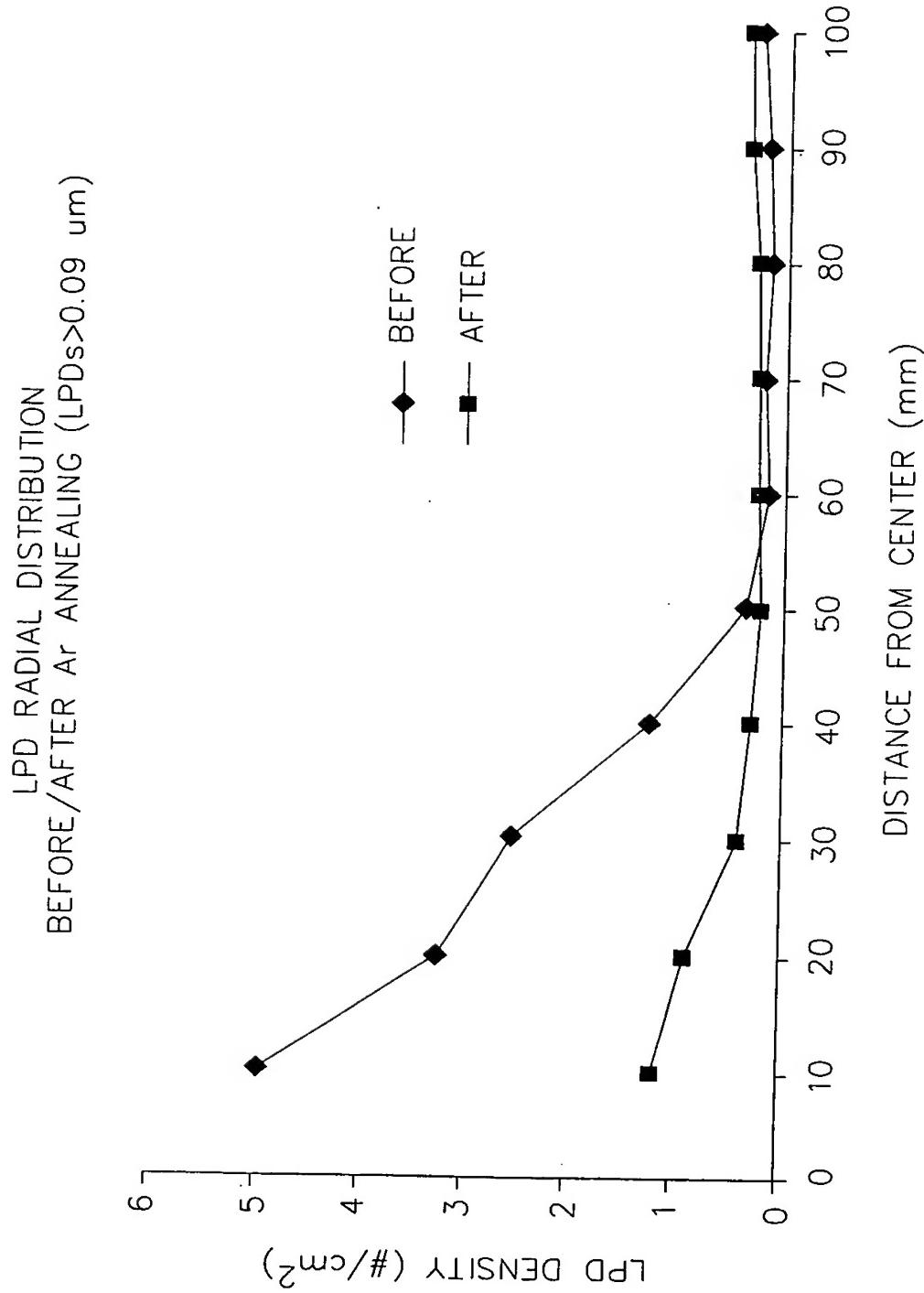


FIG. 27

LPD RADIAL DISTRIBUTION  
(BEFORE Ar ANNEALING: 0.09–0.11 um)

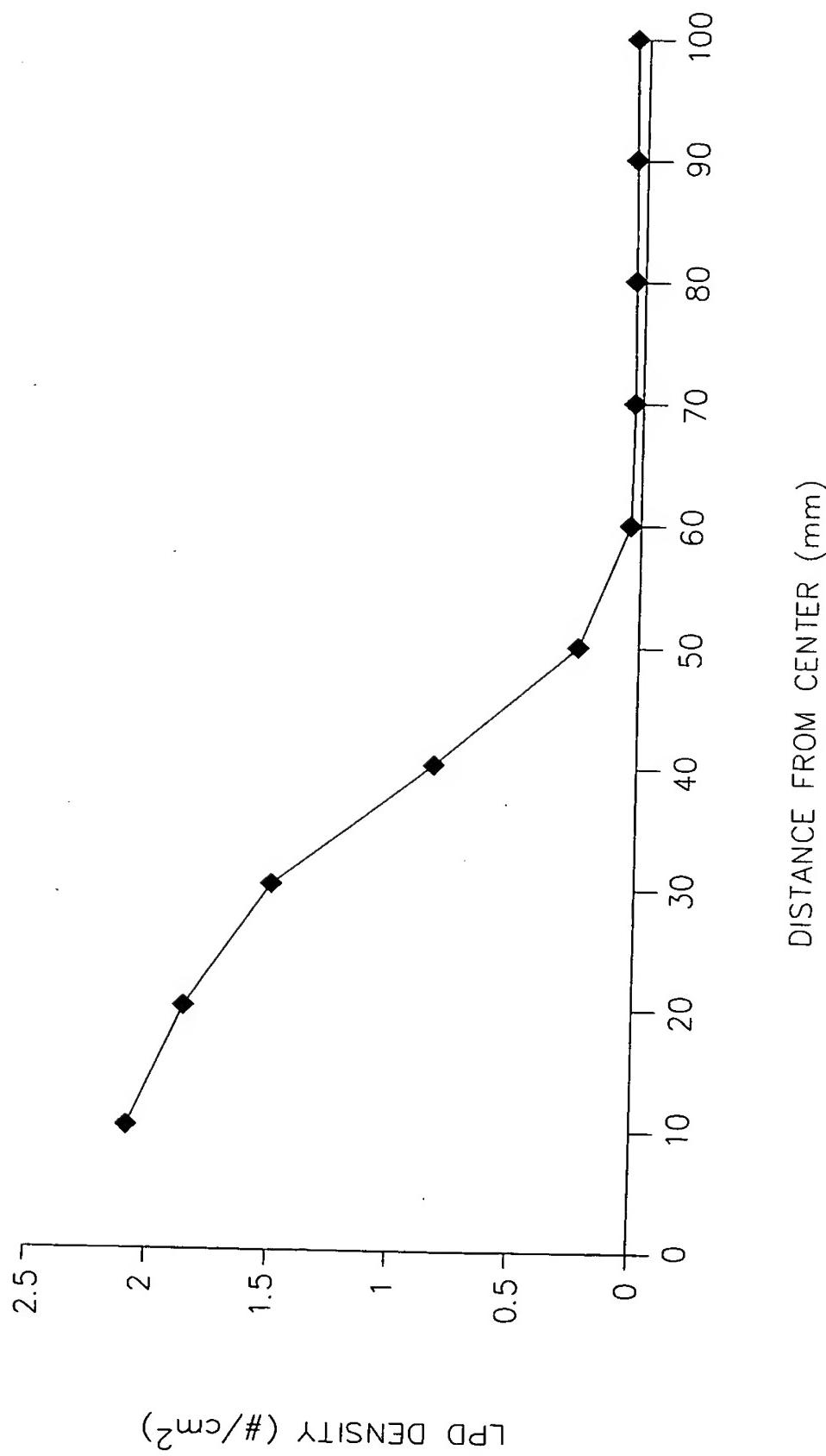


FIG. 28

LPD RADIAL DISTRIBUTION  
(AFTER Ar ANNEALING: 0.09–0.11  $\mu\text{m}$ )

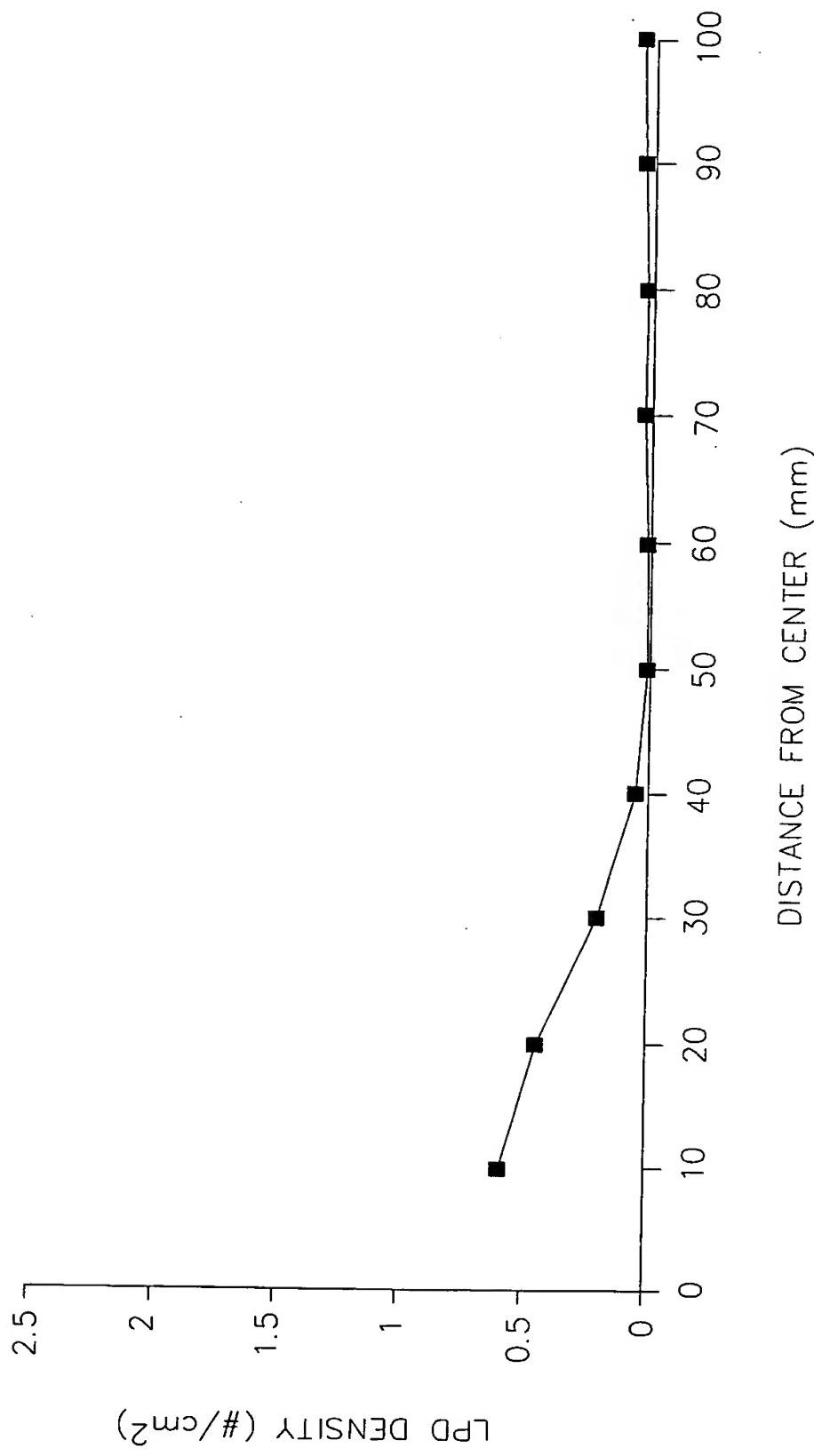


FIG. 29

LPD RADIAL DISTRIBUTION  
(BEFORE: 0.11–0.13  $\mu\text{m}$ )

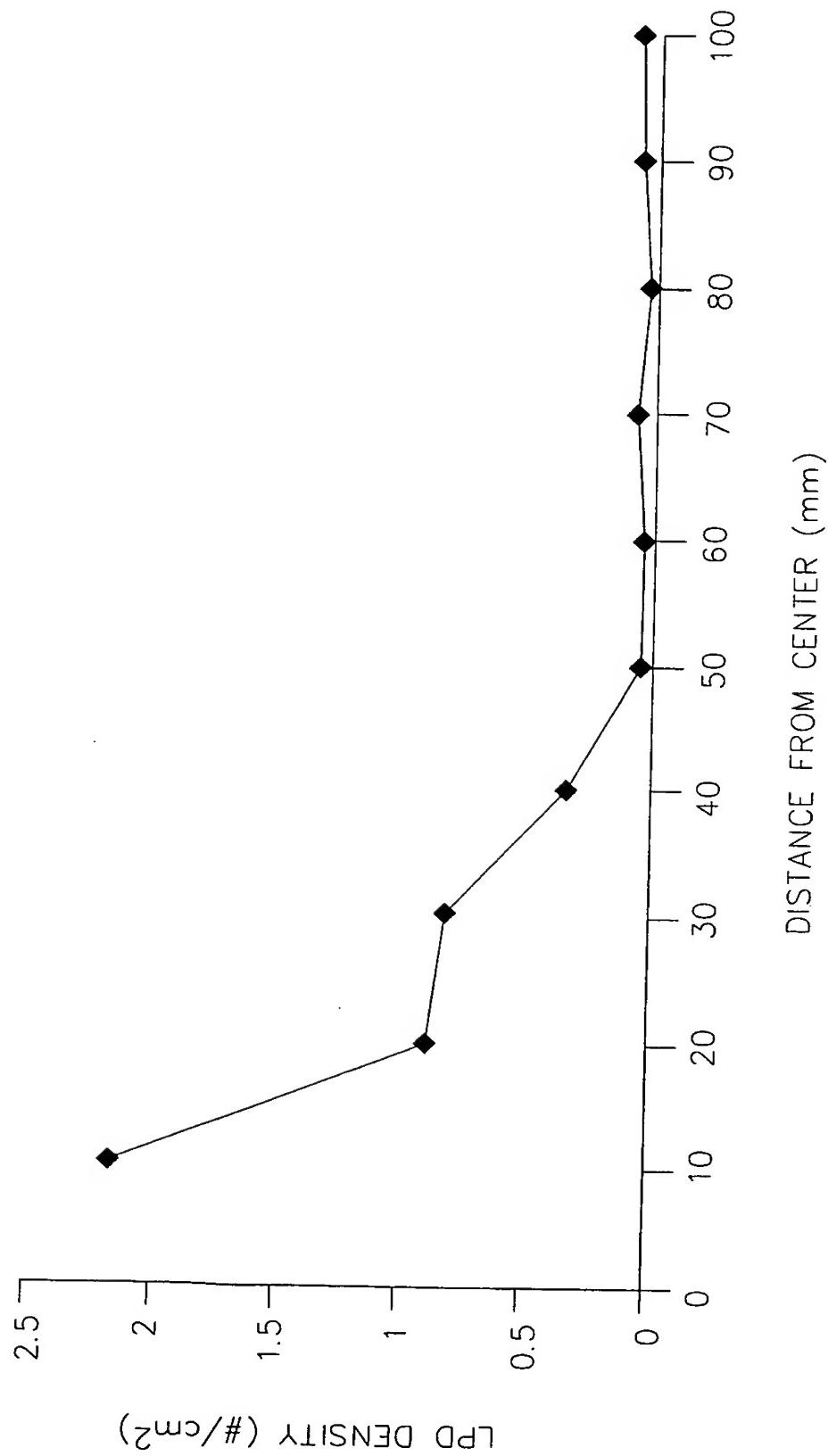


FIG. 30

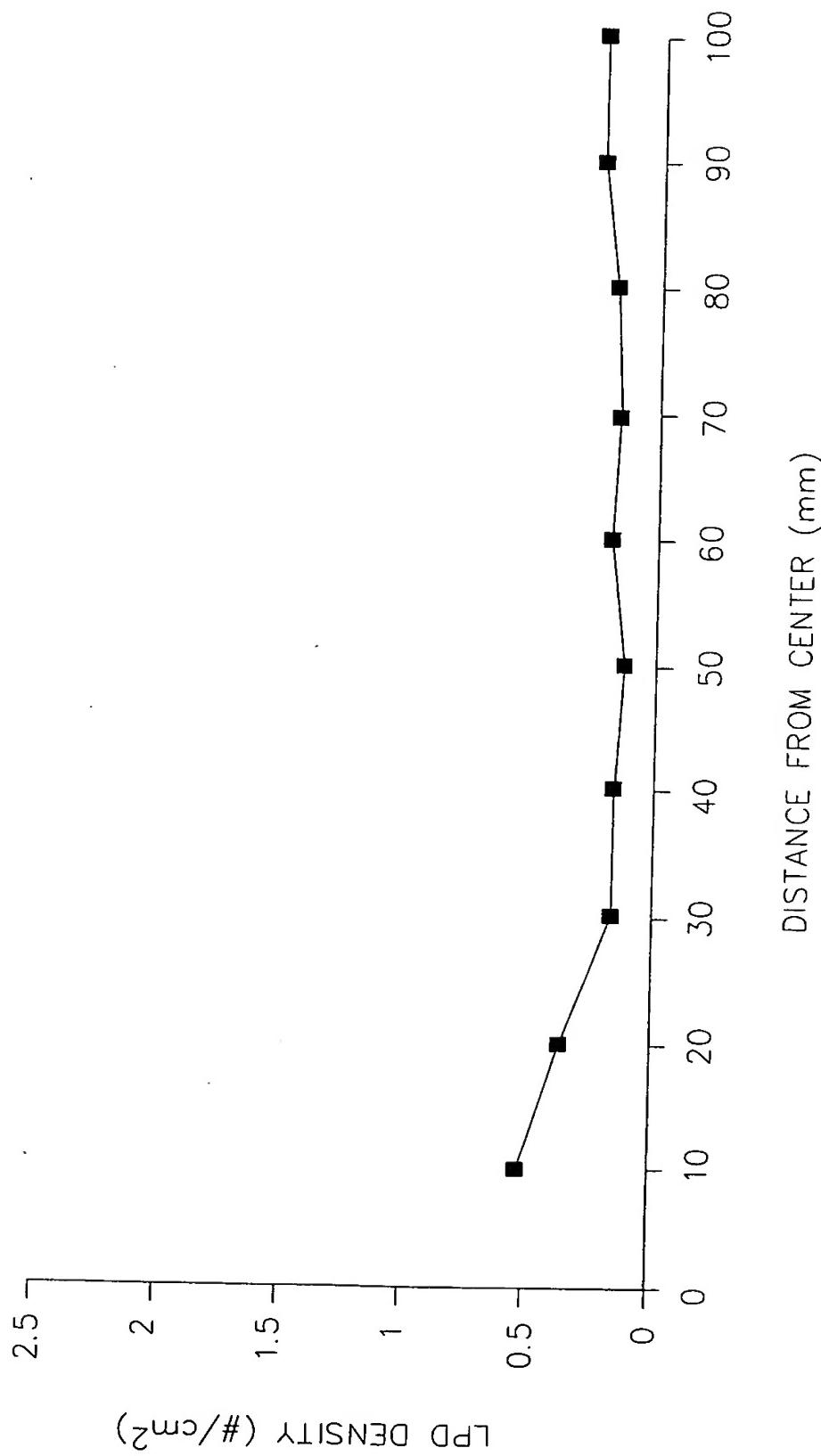
LPD RADIAL DISTRIBUTION  
(AFTER Ar ANNEALING: 0.11-0.13 um)

FIG. 31

LPD RADIAL DISTRIBUTION  
(BEFORE: 0.13–0.15  $\mu\text{m}$ )

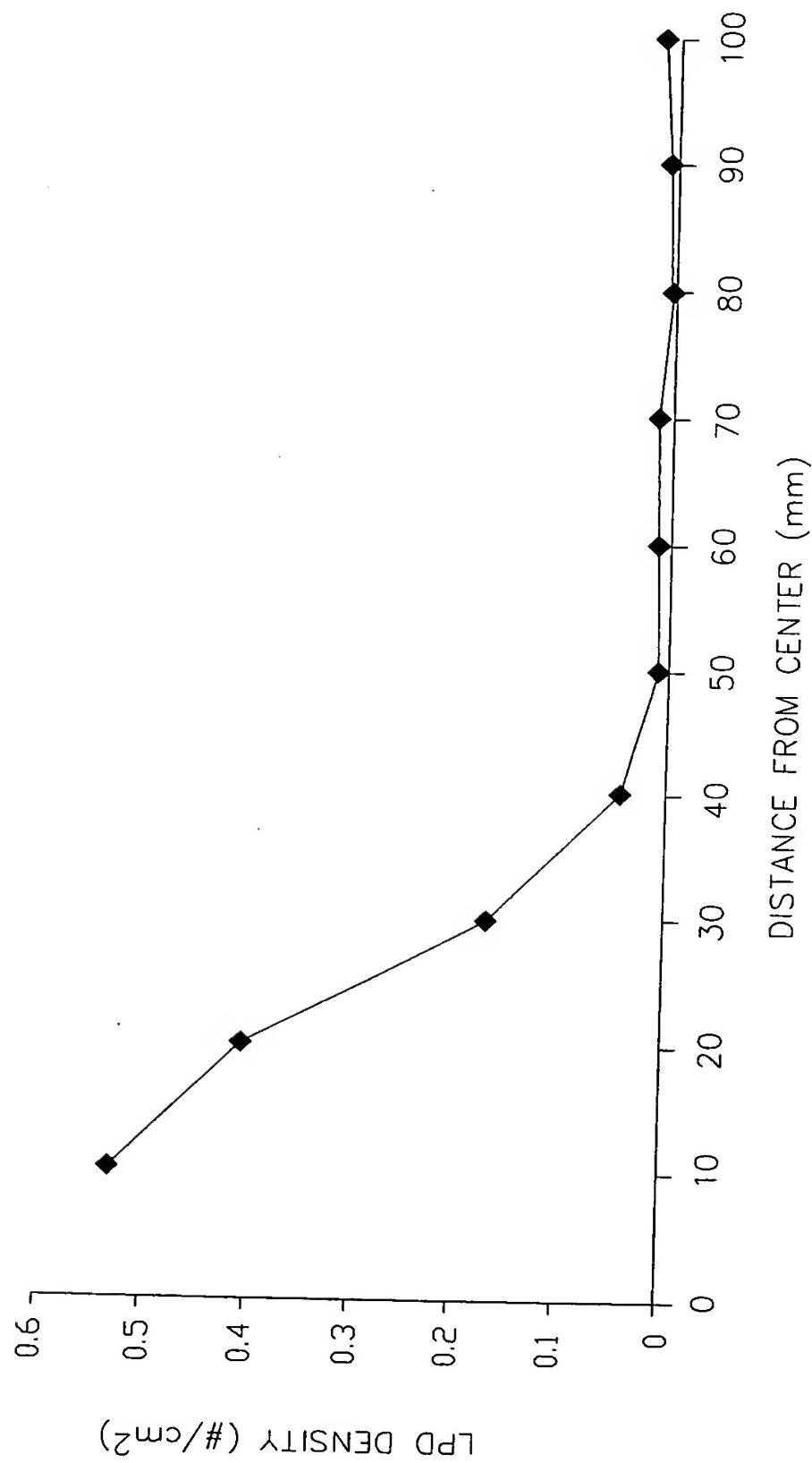


FIG. 32

LPD RADIAL DISTRIBUTION  
(AFTER Ar ANNEALING: 0.13–0.15 um)

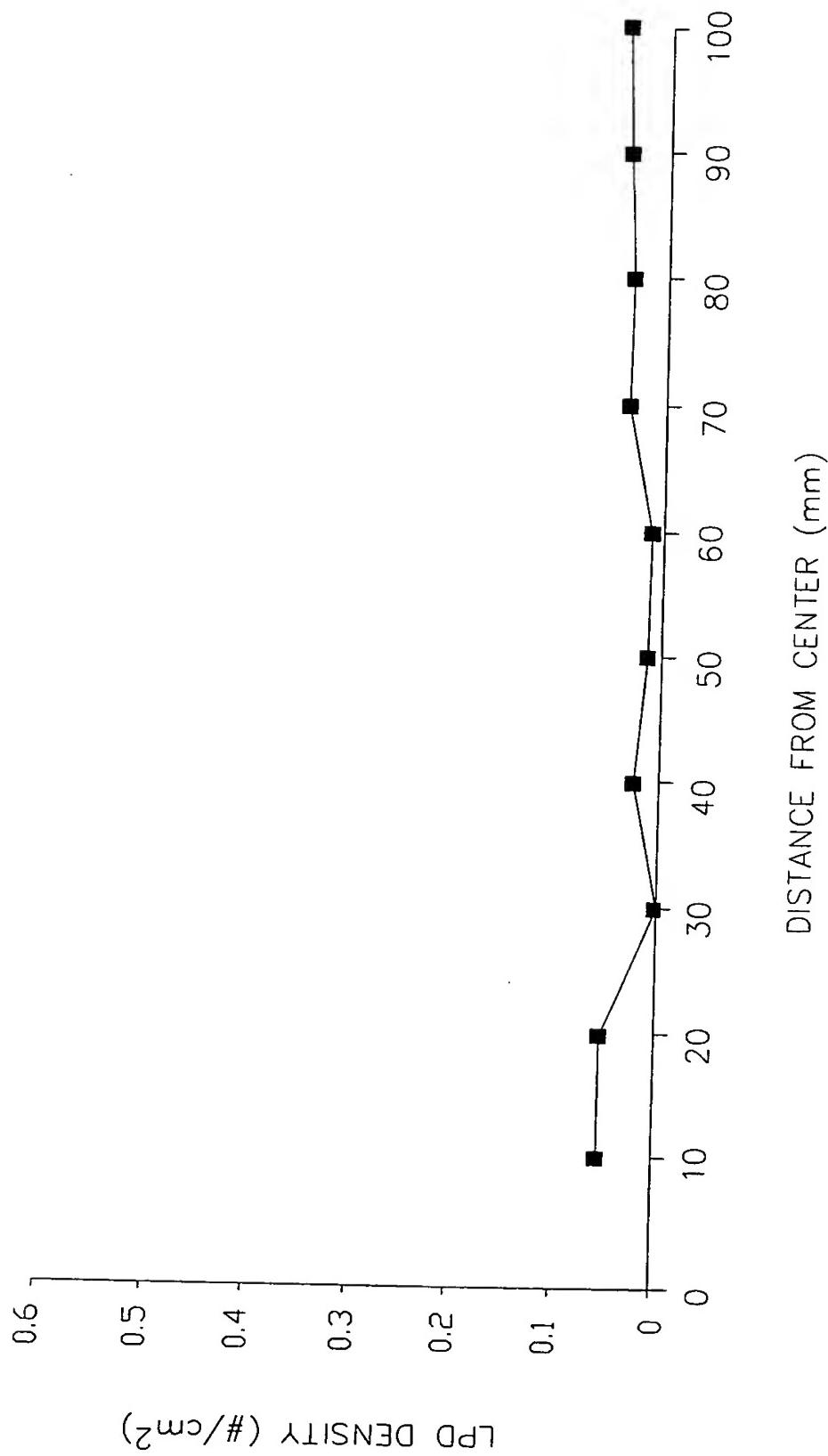


FIG. 33a

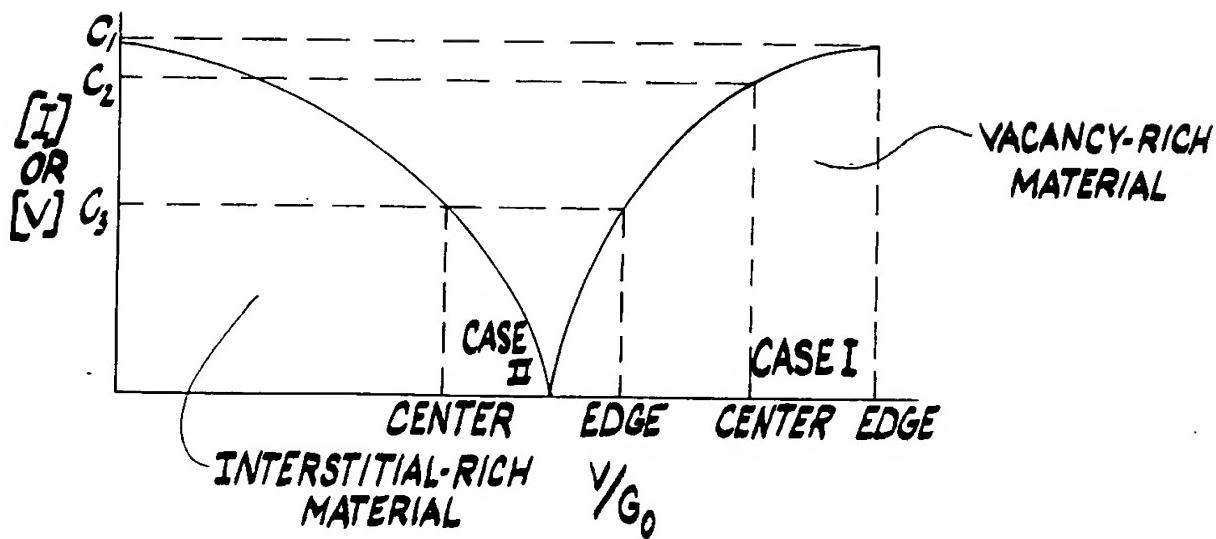
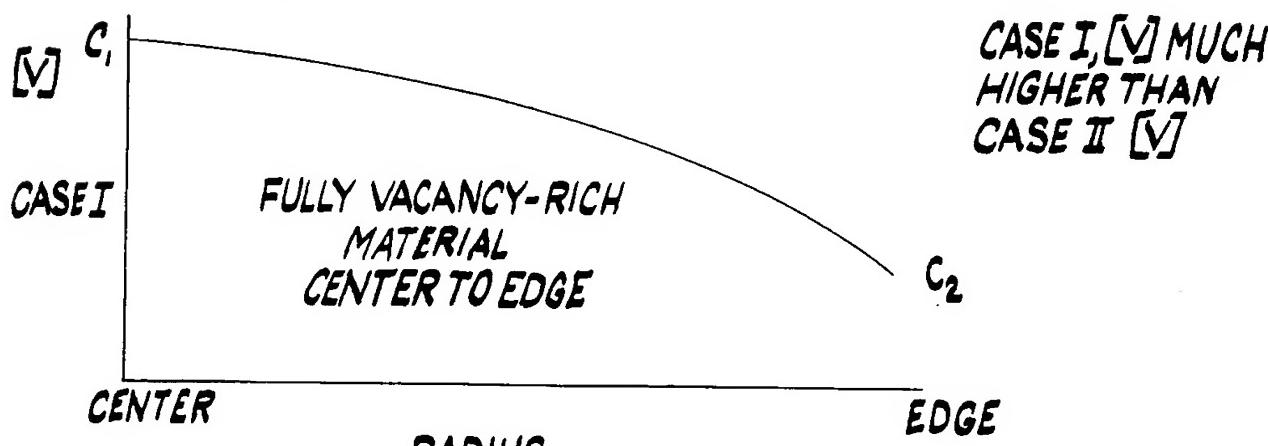


FIG. 33b



CASE I, [V] MUCH  
HIGHER THAN  
CASE II [V]

FIG. 33c

